

CLAIMS:

1. A method of sealing a vessel, comprising:
 - (a) providing a vessel's body having at least one an open end;
 - (b) providing a cover having a welding part, where said welding part has a
5 diameter less than the inner diameter of the vessel's body;
 - (c) placing the cover within said at least one an open end of the vessel's
body, thereby an air gap is formed between said vessel's body and the
welding part of said cover;
 - (d) providing a welding induction coil around said vessel's body at the
10 place where the welding part of the cover is located; and
 - (e) energizing said welding induction coil to generate a pulsed magnetic
force sufficient to cause bending a portion of the vessel's body in a radially
inward direction around the cover in said air gap, said pulsed magnetic force
has such a value so to provide mutual diffusion of atoms of the vessel's
15 body and the cover at their impact, thereby welding said vessel's body and
the cover to each other.
2. The method of claim 1 comprising expanding the vessel's body at the open
end before said placing of the cover within said open end of the vessel's body,
thereby providing enhanced holding the cover within the vessel's body.
- 20 3. The method of claim 1 comprising forming an undulated zone on the
vessel's body before said placing of the cover within the open end of the vessel's
body, said undulated zone begins at a distance equal to the size of the cover's
welding part, thereby providing enhanced holding the cover within the vessel's
body.
- 25 4. The method of any one of the preceding claims wherein said cover
includes at least one opening suitable for inserting a pipe therein.
5. The method of claim 4 comprising:
 - providing a technological plug having at least one pin
conforming with said at least one opening; and

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- inserting the technological plug into said at least one opening of the cover before the energizing of the coil, thereby .

6. The method of claim 5 wherein pins are made of a material as hard as the material of the cover.

5 7. The method of claim 5 wherein pins are made of a material harder than the material of the cover.

8. The method of claim 7 wherein pins are made of hardened steel.

9. The method of any one of the preceding claims wherein said vessel's body and said cover are made of the same material.

10 10. The method of any one of claims 1 to 8 wherein said vessel's body and said cover are made of different materials.

11. The method of any one of the preceding claims wherein said vessel's body and said cover are made of a material selected from aluminum, low carbon steel, brass, copper and their alloys.

15 12. The method of any one of the preceding claims comprising putting on an insulated cylinder on the vessels body during the energizing said welding induction coil.

13. A sealed vessel comprising:

20 a vessel's body, where said vessel's body had at least one open end before the vessel was sealed;

a cover having a welding part, where said welding part has a diameter less than the inner diameter of the vessel's body, thereby an air gap was provided between said vessel's body and the welding part of said cover placed within the said at least one open end of the vessel's body before the
25 vessel was sealed,

wherein said cover being welded to the vessel's body by a pulsed magnetic force causing bending a portion of the vessel's body in a radially inward direction around the cover in said air gap, said pulsed magnetic force has such a value so to provide mutual diffusion of atoms of the vessels body and the cover at their impact.

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14. The sealed vessel of claim 13 wherein said cover further includes a brim part, where a value of a diameter of the cover at the brim part is about the value of an inner diameter of the vessel's body, thereby to provide holding the cover within the vessel's body before the vessel have been sealed.

5 15. The sealed vessel of claim 13 or 14 wherein said cover includes at least one opening suitable for inserting a pipe therein.

16. The sealed vessel of any one of claims 13 to 15 wherein a portion of the vessel's body at the open end is expanded.

17. The sealed vessel of any one of claims 13 to 15 wherein the vessel's body
10 is undulated at the distance equal to the size of the cover welding part from the open end.

18. The sealed vessel of any one of claims 13 to 17 wherein said vessel's body and said cover are made of the same material.

19. The sealed vessel of any one of claims 13 to 17 wherein said vessel's body
15 and said cover are made of different materials.

20. The sealed vessel of any one of claims 13 to 19 wherein said vessel's body and said cover are made of a material selected from aluminum, low carbon steel, brass, copper and their alloys

21. A welding induction coil comprising at least a one-turn coil having two
20 electrodes configured for applying pulsed high voltage thereacross,

wherein said welding induction coil is configured for use with an apparatus for sealing a vessel including:

a vessel's body having at least one open end, and

a cover having a welding part, where said welding part has a diameter
25 less than the inner diameter of the vessel's body, thereby providing an air gap between said vessel's body and the welding part of said cover when the cover is placed within said at least one open end of the vessel's body;

wherein said welding induction coil is capable to generate a pulsed magnetic force causing bending a portion of the vessel's body, placed within
30 a working zone of said welding induction coil, in a radially inward direction

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around the cover in said air gap, said pulsed magnetic force has such a value so to provide mutual diffusion of atoms of the vessel's body and the cover at their impact, and thereby to weld said cover to the vessel's body.

22. The welding induction coil of claim 21 wherein a canal is formed into a
5 body of the coil for providing a passage of cooling liquid therethrough.

23. The welding induction coil of claim 22 wherein said liquid is water.

24. The welding induction coil of any one of claims 21 to 23 wherein said pulsed high voltage is in the range of about 3kV to 10kV.

25. A sealed vessel of claim 13 having a cross-section of an etched interface of
10 the joint between the vessel's welding portion and the cover's welding part substantially as described herein with reference to Fig. 3A and Fig. 3B.

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